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CANADA

DEPARTMENT OF AGRICULTURE

ENTOMOLOGICAL BRANCH

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Crop Protection Leaflet No. 15

THE PALE WESTERN CUTWORM*

The Pale Western Cutworm (*Porosagrotis orthogonia*) first appeared in injurious numbers in southern Alberta in 1911. Since that year there have been frequent outbreaks in various districts of Alberta and also in Saskatchewan and Montana. These outbreaks usually extend over a period of about three years, and the loss to grain crops from the ravages of this insect may amount, in a single year, to many thousands of dollars, much of which is due to the mistake of reseeding devastated fields too early in the season.

LIFE HISTORY

The eggs of this insect hatch early in the spring or rarely in the fall. The caterpillars do not all develop at the same rate. Even though the eggs have hatched at approximately the same date, it is possible to find worms in several different stages of development in the same field.

During the latter part of June the mature caterpillar burrows down into the soil and forms an earthen cell in which it changes to a dark brown pupa. This may take place at different times, depending upon how rapidly the worms have developed.

The moths emerge from these earthen cells about the first week in August, and they fly out at night or very late in the afternoon. For this reason they are seldom seen. They feed on the nectar of flowering weeds, and hide during the day beneath the shelter of weeds or under clods of earth.

Early in August they begin to lay eggs, and practically always choose soft, loose soil in which to lay them. A loose piece of summer-fallowed ground provides an ideal spot for egg-laying, especially if there are flowering weeds present upon which they can feed, and clods under which they can hide by day. However, the soft soil is the greatest inducement for egg-laying, and the moths will fly some distance from both weeds and clods to find such conditions.

SPECIAL HABITS OF THE PALE WESTERN CUTWORM WHICH AFFECT CONTROL

The habits of this cutworm differ from those of other common cutworms in several respects. These, unfortunately, make it very difficult to control.

The eggs are always laid in the soil, and fields that are quite free from weeds during the egg-laying period may be heavily infested in the following spring.

The cutworms rarely come to the surface except on very hard ground or after rain, and then only at night. Practically all of the feeding is done below ground. For this reason poisoned bait scattered on the surface of the ground in infested fields is not sufficiently effective to pay for its expense.

When the worms have destroyed a field of grain they do not move on to another field as do some of the other kinds of cutworms, but they stay in the devastated field, feeding on old roots, weeds and straw. It is for this reason that a destroyed field must not be re-seeded until the worms have finished feeding.

* By H. L. Seamans and E. H. Strickland

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CONTROL MEASURES

Up to the present time no adequate control for the "worms," after they appear in the spring, has been discovered. The results obtained from most methods do not warrant the expenditure. Cultural practices, such as harrowing, rolling or packing, seem to have practically no effect on the caterpillars.

Ploughing a deep furrow around infested patches in a field serves as a slight check at times, but frequently the "worms" burrow under the furrow. The furrow will, however, tend to turn back some of them, and will lessen, though it will not stop, the spread of infestation.

Deep ploughing, about three weeks after the worms have disappeared, will destroy many of the pupæ in the cells, thus preventing the moths from emerging later. Discing or cultivating will have some effect on them, but will be less efficient than ploughing.

Poisoned baits have been tried, as for other cutworms, but since this species feeds entirely underground, surface applications are practically worthless. Fair results have been obtained by harrowing the bait into the soil, and in a few instances the results have been satisfactory.

Baits will be found to be of value only when they are used very early in the season and in fields in which the damage is confined to small patches. It never pays to poison a field that is generally infested with the Pale Western Cutworm. Frequently the early infestation is confined to small knolls in a field. If, during the latter part of April, or early in May, there are signs of feeding on these places, and it is certain that the rest of the field is not infested, they should be poisoned immediately at the rate of about 50 pounds of bait per acre. The bait must be harrowed in and a deep furrow should then be ploughed a few feet beyond the damaged area. This will tend to check the spread, though it will not entirely stop it.

The most reliable poisoned bait mixture for prairie conditions is the following: Shorts, 50 pounds; Paris green or white arsenic, 2 pounds; molasses, 1 gallon; water, 1½ gallons. Shorts are preferable to bran for dry-farming conditions, because no bait can be kept moist when applied to the soil, and the cutworms will eat dry shorts when they refuse dry bran. In seasons when the soil is moist the shorts can be replaced with bran, in which case 4 gallons of water should be used instead of 1½ gallons.

OTHER CONTROL METHODS NOT RECOMMENDED

The use of substances harrowed into the soil, such as lime and salt, is not recommended. For large areas they are too expensive, and neither lime nor salt in practicable quantities have been found to give any beneficial results.

Nothing has been found with which the seed can be treated to prevent injury, as the cutworm does not feed on the seed, and no treatment known at present will make the plant distasteful to the cutworms without damaging it.

PREVENTION OF CUTWORM INFESTATION

Very often fields can be found in a badly infested district which are entirely free from cutworm damage. A thorough study of fields and the methods in which they have been cultivated shows that fields which were mellow or covered with soft earth during the month of August are usually heavily infested with "worms" in the following year. In addition to this, moths have been observed depositing eggs, and in all instances they have avoided hard soil, selecting the soft earth. The presence or absence of weeds seems to have very little to do with the selection of places for egg-laying.

From all observations made on the cutworm, both here and elsewhere, there is but one recommendation that can be made. This is not a control of the pest, but is merely a prevention, and it must eventually be superseded at some future date by a control method. Fields which are to be summer-fallowed must be worked early, and should be thoroughly cultivated during June and July in order to germinate all

weed seeds, and to destroy the weeds. *All work must be stopped by the 1st of August and the field left entirely alone until September 15.* If the field be quite clean by the end of July any weeds that germinate later will not reach the flowering stage in time to attract the moths as a feeding ground.

The most important thing, however, is that any light shower will tend to cake the surface of the soil and to seal up the cracks around clods. This will destroy all hiding places for the moths and the caked surface will not be attractive to them for egg-laying.

If a fall grain crop is to be sown, such as fall rye or wheat, it is advisable to have the crop in by August 1 rather than to invite the moths to lay their eggs in the soil by working it between August 1 and September 15, which is the critical period with the cutworm, during which the land should be disturbed as little as possible.

An unusually thorough late fall ploughing, seven or eight inches deep, followed by packing, undoubtedly buries the eggs so deeply that some of the "worms" will not reach the surface of the ground.

When a field, which is suspected of having cutworm eggs present, is to be seeded to a spring crop a saving can be made by sowing a single drill-width diagonally across it as early as possible. If the grain comes up and shows no signs of cutworm injury it is safe to seed the entire field. If, however, the grain is destroyed, the field should not be seeded until the worms have stopped feeding. While this may tend to make crops a little late, it will save a great loss from seeding badly infested fields.

RE-SEEDING AFTER THE FIRST CROP HAS BEEN DESTROYED BY CUTWORMS

The entire period for development of the Pale Western Cutworm varies from sixty to one hundred days. Re-seeding while the majority of the "worms" are only partially developed is a dangerous practice, for after they have destroyed one crop they may easily destroy a second, or even a third, seeding.

On account of the variation in development on different fields no definite date can be given as to when re-seeding is safe. For a chart which shows the time to re-seed write to the nearest Entomological Laboratory for Crop Protection Leaflet No. 11.

SUMMARY OF IMPORTANT FACTS

1. The eggs are laid between August 1 and September 15.
2. The moths hide under clods of earth in the fields, but they lay their eggs in soft soil.
3. Fields should be clean by July 31, and should be left alone till September 15.
4. Loss can be avoided by testing out suspected fields early in the spring.
5. The "worms" do not leave a field in which they have destroyed the crop.
6. Use the re-seeding chart in order to avoid additional loss.

NECESSITY OF RECOGNIZING SPECIES OF CUTWORMS

The Pale Western Cutworm can generally be recognized by its colour. It is nearly uniform slaty grey, with a light-yellowish head, on which are two short black dashes.

Many of the other species of common cutworms have distinct coloured stripes along the body, and are usually a lighter colour underneath. Nearly all these can be easily and cheaply controlled. If there is any doubt as to whether damage is being caused by the Pale Western Cutworm or by one of the other kinds of cutworm, place a few speciments in a tin box with a little moist earth, and send them for determination and advice to the Dominion Entomological Laboratory at either Lethbridge, Alta.; at Saskatoon, Sask.; or at Treesbank, Man.

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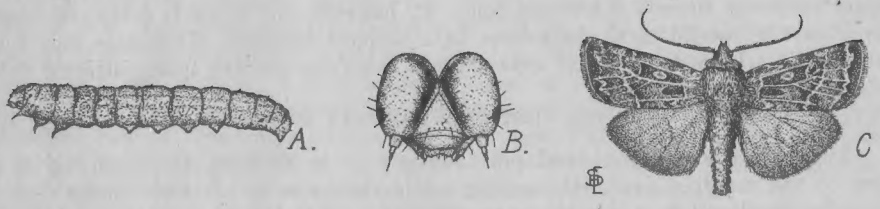

A—Full grown cutworm.
B—Head of cutworm enlarged;
C—Moth of Pale Western Cutworm.
A and *B* natural size (Original).